UNIVERSITY OF DHAKA

Department of Computer Science and Engineering

CSE-3112 : Software Engineering Lab

Project Proposal

Project Title

BidCraft: Online Bidding Platform

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1.1 Statement of the Project (Product)

BidCraft: Online Bidding Platform is an innovative web-based platform designed to revolutionize the way individuals and businesses engage in online auctions. This platform provides a user-friendly interface, enabling seamless participation in auctions, bid placement, and efficient management of listings. BidCraft aims to create a dynamic and engaging online marketplace where users can discover unique items, competitive pricing, and a variety of bidding strategies.

1.2 Justification

The project addresses the increasing demand for sophisticated online bidding platforms. BidCraft stands out by offering a streamlined and interactive bidding experience, making it an attractive option for sellers seeking a broader audience and buyers looking for unique items and competitive prices. With the proliferation of online shopping, the bidding model provides an exciting and engaging alternative.

1.3 Objectives and Goals

The primary objectives of BidCraft include:

- Creating a user-friendly online bidding platform that caters to users of all experience levels.

- Facilitating seamless auctions for a diverse range of products and services.

- Attracting a broad user base of both sellers and buyers through innovative features.

- Ensuring secure and transparent transactions to build trust among users.

- Implementing features for efficient bid management and comprehensive auction tracking.

- Providing a dynamic marketplace for unique and in-demand items to captivate users.

- Enhancing user engagement through interactive bidding features and personalized recommendations.

1.4   Achievements and Benefits

BidCraft aims to achieve the following:

- Establishment of a dynamic online marketplace that evolves with user preferences.

- Increased accessibility for sellers to reach a broader and more diverse audience.

- Offering unique and engaging bidding experiences, fostering user loyalty.

- Transparent and secure transaction processes to instill confidence in users.

- Diverse product offerings, attract a wide range of users with varied interests.

- User satisfaction through a user-friendly interface, prompt customer support, and interactive features.

- Economic contributions by fostering online commerce and supporting small businesses.

2   Project Background

2.1   Technical Background

BidCraft will leverage cutting-edge technologies to ensure a secure, scalable, and user-friendly platform:

- **Web Development Stack:** Utilizing JavaScript, and ReactJS for an intuitive front-end experience.

- **Backend Development:** Employing FastAPI for robust server-side development.

- **Database Management:** Utilizing PostgreSQL and MySQL for efficient data storage and retrieval.

- **Payment Gateway Integration:** Implementing a secure and reliable payment processing system.

2.2 Commercial Background

The online bidding market is a lucrative sector with substantial growth potential. BidCraft aims to tap into this market by offering a feature-rich platform that caters to the needs of both sellers and buyers. The platform aligns with the growing trend of online shopping, providing an exciting and interactive alternative through the bidding model.

2.3 Scientific Background

The core functionality involves creating a secure and efficient system for users to submit bids, view items or services up for auction, and dynamically update bid information in real time. The platform often utilizes algorithms for bid matching, ensuring fair competition and optimizing the allocation of resources. User experience and interface design are also critical scientific considerations, incorporating principles of human-computer interaction to create an intuitive and user-friendly environment. Additionally, the platform may employ machine learning algorithms to analyze bidding patterns, detect anomalies, and enhance the overall efficiency of the auction process. In summary, the scientific background of a bidding platform web app involves a multidisciplinary approach, integrating concepts from frontend and backend, database management, security, and user experience design to create a robust and efficient online bidding platform.

3 Project (Product) Description

3.1 Product perspective

The product perspective of the BidCraft project is to provide a client-to-client e-commerce platform where a user can buy and sell products by making a bid. On this platform, registered users can list their old or new products, setting a minimum selling price and a specified time range. Other registered users can then place bids on the product. After the designated period, the person with the highest bid will be the successful buyer. The platform will be accessible in English and include an interactive interface for posting, bidding, and a secure payment system.

Additionally, we will maintain user profiles to allow buyers to provide ratings, enhancing the trustworthiness of sellers. The platform will also feature a Q&A option, allowing users to inquire about products, and sellers can respond to these queries. A search option will assist buyers in finding specific products, while a filter system will enable users to narrow down their search based on price ranges. Furthermore, product categories will be available, offering a convenient way for users to locate specific types of products in one place.

In the long term, our commitment is to enhance the security and services offered on the platform continually. To ensure the authenticity of product categories, quality, and sellers, we have established and managed a dedicated team responsible for meticulously verifying products. The listing process is conducted by our team members, instilling confidence in buyers to place bids with trust. As a client-to-client application, our platform currently does not facilitate delivery or doorstep services. However, we have a dedicated team in place to efficiently manage these aspects. Additionally, a comprehensive warranty is provided, categorizing products into two types: BidCraft Verified and Unverified. We provide a warranty on verified products. Our assurance is to deliver 100% security, reliable services, and products of verified quality to the buyers.

The platform will cater to two distinct user types: public users and registered users. Public users will have the capability to view products and navigate the site, while registered users will enjoy a more comprehensive set of features. Registered users will be able to enlist products, place bids, provide feedback, upvote or downvote products, and engage in communication through contact/chat functionalities. In the long term, our vision includes the establishment of specialized staff roles to enhance user experience. This will involve a dedicated team for product verification, technicians to address warranty-related and other technical concerns, as well as delivery personnel responsible for ensuring the seamless delivery of purchased products to buyers. Overall Bybid is a buyer-to-buyer e-commerce site. The platform is committed to providing a secure and trustworthy environment for buyers and sellers, with a focus on product authenticity, quality assurance, and reliable services. As the platform evolves, we strive to continually improve security measures and overall service quality to meet the needs of our users.

3.2   General capabilities

The BidCraft project will require several capabilities to be implemented successfully. The project will require knowledge of several programming languages including Java, JavaScript, and Python. This will be necessary for developing the server-side and client-side of the platform.

In addition to programming languages, the project will also require knowledge of specific frameworks and technologies such as FASTAPI, React, and REST API. FastAPI is a high-performance Python web framework designed for building APIs. Leveraging Python-type hints, it automatically validates data and generates detailed API documentation. With support for asynchronous programming, a robust dependency injection system, and built-in security features, FastAPI makes it easy to develop efficient and secure APIs quickly. Its simplicity, speed, and automatic documentation make it a popular choice for developers working on modern web applica-

tions. React is a JavaScript library for building user interfaces, developed by Facebook. It enables the creation of dynamic, component-based UIs that efficiently update in response to data changes. REST API is a set of rules for building web services, it will be used to build the platform's API that will enable communication between the front end and the back end.

Moreover, the BidCraft project will necessitate proficiency in database management systems, such as MySQL or MongoDB and NoSQL database(firebase) to effectively store and retrieve data.

In summary, the BidCraft project demands proficiency in Java, Javascript, and Python, along with expertise in frameworks like FastAPI and React, and technologies such as REST API. A solid understanding of databases like PostgreSQL and MongoDB is essential to ensure the creation of a robust and efficient platform aligned with the project's objectives and goals.

3.3   General constraint

Certainly! When implementing the BidCraft project, various constraints should be taken into account. These may include:

Time Constraints: There might be deadlines or timeframes within which the project needs to be completed. Balancing the desired features with the available time is essential for successful implementation.

Budget Constraints: The availability of financial resources may limit the extent of features, development time, and overall project scope. Careful budgeting is crucial to ensure the project stays within financial constraints.

Technological Constraints: Compatibility issues, limited support for certain technologies, or dependencies on third-party services may pose challenges during development. The chosen technologies should align with the project's goals and constraints.

Regulatory and Compliance Constraints: Adherence to legal regulations and industry standards, especially in areas such as user data protection and financial transactions, is critical. Non-compliance could lead to legal issues and reputational damage.

Resource Constraints: The availability of skilled personnel, both in terms of developers and support staff, may influence the pace and success of the project.

Scalability Constraints: The platform should be designed with scalability in mind to accommodate growth in user base and increasing data volume. Using the OOPs concept we try to make it scalable.

User Experience Constraints: Balancing feature richness with simplicity and usability is essential. User experience constraints involve ensuring that the platform is intuitive and user-friendly to meet the expectations of a diverse user base.

Security Constraints: Building a secure platform is paramount. Constraints related to data security, encryption standards, and compliance with

security best practices need to be addressed to safeguard user information and transactions.

Testing and Quality Assurance Constraints: Limited testing resources and time constraints can impact the thoroughness of testing.

Environmental Constraints: Consideration of the platform's environmental impact, such as energy consumption and server resource usage, is increasingly important in today's eco-conscious landscape.

Language constraint: The platform will be in English, it will be important to ensure that the platform is accessible to users who are not fluent in either language.

Legal Constraints: The project will be subject to local laws and regulations, it will be important to ensure that the platform complies with all relevant laws and regulations.

By identifying and addressing these constraints early in the planning and development phases, the BidCraft project can navigate potential challenges more effectively and increase the likelihood of successful implementation.

3.4 User Characteristics

This project will have two different users:

Public Users: Public users on the BidCraft platform have the freedom to explore the offerings without the need for registration. They can effortlessly browse through product listings, access general information about the platform, and explore various product categories. While they can gain insights into the available products, public users cannot enlist items, place bids, or engage in direct interactions.

Registered Users: In contrast, registered users on the BidCraft platform enjoy a more robust and interactive experience. By creating an account, they gain the ability to enlist their products for sale, complete with detailed descriptions and images. These users can actively participate in the marketplace by placing bids on listed items, providing valuable feedback on transactions and product quality, and engaging in direct communication with other users through contact/chat functionalities. The registered user status unlocks a range of features, fostering a dynamic and engaging environment for buying and selling within the BidCraft community.

In the long-term version also add three more types of users. Those are:

Staff: Staff members will play a crucial role in product verification and overall platform management. They will ensure the accuracy of product information, maintain quality standards, and contribute to the smooth operation of the platform.

Technician: Technicians will be responsible for addressing warranty-related concerns and handling technical issues. Their expertise will contribute to

resolving product-related queries and ensuring customer satisfaction with the technical aspects of the platform.

Delivery Man: Delivery personnel will be tasked with the responsibility of updating product locations after a successful sale. Their role is vital in ensuring that the products reach the buyers promptly and efficiently.

3.5 Operational Environment

The BidCraft project will be deployed within a web-based environment, ensuring accessibility across a diverse range of devices including computers, laptops, tablets, and smartphones. Users can seamlessly engage with the platform through a standard web browser, making it versatile and accommodating to different device preferences. The platform will be hosted on a dedicated web server, providing users with access via a designated URL or web address. This approach ensures a user-friendly and widely accessible experience, allowing individuals to connect with the BidCraft marketplace effortlessly from their preferred devices.

The BidCraft project will leverage a cloud-based infrastructure to host the web server, ensuring scalability and high availability. This strategic choice empowers the platform to efficiently handle a substantial user base and navigate traffic spikes seamlessly. In prioritizing user data safety, the platform will adhere to standard security protocols and guidelines, guaranteeing robust protection against potential threats.

To ensure compatibility within the web-based environment, advanced technologies will be employed. ReactJS will drive the front end, delivering an engaging and responsive user interface, while Spring Boot will handle the back-end operations, ensuring efficient functionality that aligns seamlessly with web browsers and servers.

In essence, the BidCraft project's deployment in a web-based environment guarantees accessibility across various devices through standard web browsers. Hosting on a cloud-based infrastructure underscores the commitment to scalability and availability. The incorporation of cutting-edge technologies prioritizes a seamless user experience, and stringent security measures safeguard user data, collectively ensuring a robust and reliable platform for the BidCraft community.

4 Innovation and Entrepreneurship

4.1 Innovation requirement

To accomplish the project, several innovations will be required. Those are:

Build a Reliable and User-Friendly Web App: We'll create a web app that works well, is dependable, and is easy for users to navigate. It should be strong, and secure, and provide a smooth experience for everyone involved.

Smart Marketing Strategies with AI: Implementing clever marketing strategies is crucial. We'll leverage AI to identify the right products and assist sellers in targeting their specific market areas. This smart approach ensures effective promotion and engagement.

Long-Term Personalized Product Recommendations: In the long run, we aim to use optional data to understand users better. This way, we can show them products they are likely to be interested in. It's about extending and refining the user experience by offering personalized suggestions.

In summary, by focusing on these innovations, we aim to create a powerful, secure, and user-friendly platform while utilizing AI for smart marketing and personalized product recommendations.

4.2 Entrepreneurship requirement

For the BidCraft project to succeed, we need a good dose of entrepreneurship. This means being creative and proactive in making the project thrive. Here are a few steps we'll take:

Boosting this site: To boost the BidCraft project, we'll advertise on popular platforms like YouTube and Facebook. This means creating attractive ads that reach a large audience on these widely-used sites. This way, more people will get to know about BidCraft and what it offers, helping us grow and succeed.

Promotions and Special Offers: We'll work on attracting people to our site by offering special deals and promotions. This will make our platform more appealing, encouraging users to explore and engage.

Building a Delivery Team with Vehicles: To make sure products reach buyers efficiently, we'll create a team for deliveries. This team will need vehicles for transportation, ensuring a smooth process from purchase to delivery.

5   Conclusion

In conclusion, the BidCraft project is envisioned as a dynamic and user-centric online marketplace. Designed to accommodate both public and registered users, it aims to provide a seamless and engaging experience for

buying and selling various products. The platform's long-term goals include the incorporation of staff, technicians, and delivery personnel to enhance the verification process, address technical concerns, and ensure efficient product delivery.

The deployment in a web-based environment, hosted on a cloud infrastructure, reflects a commitment to scalability, availability, and accessibility across devices. By employing cutting-edge technologies, such as ReactJS and FastAPI, the platform aspires to offer a reliable, robust, and secure web application.

Innovations, such as leveraging AI for marketing strategies and personalized product recommendations, demonstrate a forward-thinking approach to enhance user engagement. Entrepreneurial initiatives, such as promotions and building a dedicated delivery team, underscore a proactive effort to ensure the project's success.

Ultimately, the BidCraft project aspires to carve its place in the online marketplace landscape by providing a secure, user-friendly, and innovative platform that caters to the diverse needs of buyers and sellers.